

wherein biaxial strain on said thin film changes in response to a change between said second and said first inner perimeter of said ring.

**37.** An apparatus as recited in claim 36, wherein:

said second inner perimeter of said ring is configured in a first shape; and

wherein said first shape is selected from the group consisting essentially of a circle, an oval and a polygon.

**38.** An apparatus as recited in claim 36, wherein said device adapted to be positioned in a specimen holder of a transmission electron microscope.

**39.** An apparatus as recited in claim 36:

wherein said thin film is supported on a substrate; and

said substrate is coupled to said ring.

**40.** An apparatus as recited in claim 36, wherein said first inner perimeter of said ring is up to about five percent larger than said second inner perimeter of said ring.

**41.** An apparatus as recited in claim 36, wherein said ring is adapted to be reversibly changed from said first inner perimeter to said second inner perimeter at about room temperature.

**42.** An apparatus as recited in claim 36, wherein temperature of said ring changes in response to electric current applied to said ring.

**43.** An apparatus for reversibly changing the outer perimeter of a tube of shape memory alloy, comprising:

a die having a distal end, a near proximal portion and a proximal end;

wherein said die has a bore with a first perimeter and a second perimeter;

wherein said second perimeter is smaller than said first perimeter of said bore;

wherein said first perimeter of said bore extends from said distal end to said near proximal portion of said die;

wherein said second perimeter of said bore is positioned at said proximal end of said die;

wherein said bore is tapered between said first perimeter and said second perimeter from said mid proximal portion to said proximal end of said die; and

pressure inducing means adapted to extrude said tube of shape memory alloy from said distal end of said die, through said bore and through said proximal end of said die;

wherein the outer perimeter of said tube of shape memory alloy is reversibly changed when said tube is inserted in said bore at said distal end of said die and extruded out said proximal end of said die by said pressure inducing means.

**44.** An apparatus as recited in claim 43, wherein said pressure inducing means comprises:

a pin having a distal end, a mid proximal portion and a proximal end;

said pin having a first perimeter and a second perimeter;

wherein said first perimeter of said pin corresponds to said first perimeter of said bore;

wherein said first perimeter of said pin extends from said distal end of said pin to said mid proximal portion of said pin;

wherein said second perimeter of said pin corresponds to said second perimeter of said bore;

wherein said second perimeter of said pin extends from said mid proximal portion of said pin to said proximal end of said pin;

wherein said distal end of said pin is further adapted to receive pressure from a press; and

wherein said outer perimeter of said tube of shape memory alloy is reversibly changed when said tube is inserted in said bore at said distal end of said die, said proximal end of said pin engages said tube, and said tube is extruded out said proximal end of said die by pressure exerted on said pin from said press.

**45.** A method for imparting a biaxial strain on a thin film, comprising:

providing a ring of shape memory alloy having a first inner perimeter;

reversibly changing said first inner perimeter of said ring to a second inner perimeter;

securing a thin film on said ring;

changing the temperature of said ring; and

imparting biaxial strain on said thin film by changing said ring between said second inner perimeter and said first inner perimeter in response to changing the temperature of said ring.

**46.** The method recited in claim 45, further comprising:

changing the temperature of said ring by applying electric current to said ring.

**47.** The method recited in claim 45, further comprising:

providing a removable wax disc;

positioning said wax disk in said second perimeter of said ring;

depositing said thin film on said ring and on said wax disc; and

removing said wax disc.

**48.** A method for reversibly imparting biaxial strain on a thin film, comprising:

providing a first ring of shape memory alloy having a first inner perimeter;

reversibly changing said first inner perimeter of said ring to a second inner perimeter;

providing a second ring of shape memory alloy having a first outer perimeter;

aligning said first outer perimeter of said second ring to correspond with said second inner perimeter of said first ring;

coupling said second ring to said first ring;

securing a thin film to said first ring;

changing the temperature said first ring;